

IN THE CLAIMS

This listing of claims replaces all prior versions, and listings, in this application.

1. - 10. (Canceled)

11. (Previously Presented) Process for the preparation of a polymer comprising monomeric units of ethylene,

an α -olefin and

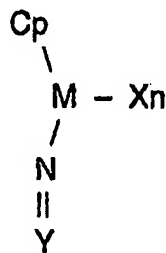
a vinyl norbornene ,

applying as a catalyst system:

a. a group 4 metal containing ~~an~~ catalyst having a single cyclopentadienyl ligand and a mono substituted nitrogen ligand, wherein said catalyst is defined by the formula I:

~~b. an aluminoxane activating compound,~~

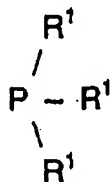
~~c. 0 – 0.20 mol per mol of the catalyst of a further activating compound,~~



Form. I.

wherein Y is selected from the group consisting of:

ai) a phosphorus substituent defined by the formula:



Form. II.

wherein each R^1 is independently selected from the group consisting of

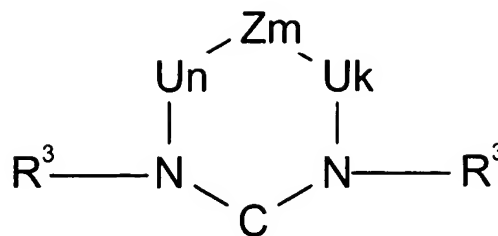
a hydrogen atom,
a halogen atom,
C₁₋₂₀ hydrocarbyl radicals which are unsubstituted by a halogen atom
C₁₋₂₀ hydrocarbyl radicals which are further substituted by a halogen atom,
a C₁₋₈ alkoxy radical,
a C₆₋₁₀ aryl radical
a C₆₋₁₀ aryloxy radical,
an amido radical, and
a silyl radical of the formula:



wherein each R² is independently selected from the group consisting of
hydrogen,
a C₁₋₈ alkyl radical,
a C₁₋₈ alkoxy radical,
C₆₋₁₀ aryl radicals,
C₆₋₁₀ aryloxy radicals, and
a germanyl radical of the formula:



wherein R^{2'} is independently selected from the group consisting of
hydrogen,
a C₁₋₈ alkyl radical,
a C₁₋₈ alkoxy radical,
C₆₋₁₀ aryl radicals and,
C₆₋₁₀ aryloxy radicals,
a) a substituent defined by the formula:



Form. V.

wherein each of U is C R³ R³, C=C R³ R³, C=N R³, SiR³R³, C=O, N R³, P R³, O or S,

Z is - A=A, and each A is C R³, N or P,

each R³ is independently selected from the group consisting of hydrogen,

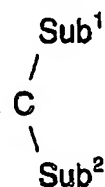
hydrocarbyl radical,

silyl radical according to form. III and

germyl radical according to form. IV,

k, m and n have independently the value 0, 1, 2 or 3, provided that k + m + n > 0 and

aiii) a substituent defined by the formula:



Form. VI.

wherein each of Sub¹ and Sub² is independently selected from the group consisting of hydrocarbyls having from 1 to 20 carbon atoms, silyl groups, amido groups and phosphido groups;

Cp is a ligand selected from the group consisting of cyclopentadienyl, substituted cyclopentadienyl, indenyl, substituted indenyl, fluorenyl and substituted fluorenyl;

X is an activatable ligand and n is 1 or 2, depending upon the valence of M and the valence of X; and

M is a group 4 metal selected from the group consisting of titanium, hafnium and zirconium, and

b. an aluminoxane activating compound,

to produce said polymer with the following properties:

[VNB] > 0.01 and

$\Delta\delta > 30 - 15*[VNB]$, provided that $\Delta\delta$ is not negative,

[VNB] is the content of vinyl norbornene in the polymer in weight % and

$\Delta\delta$ is, expressed in degrees, the difference between the phase angle δ at

an angular frequency of 0.1 rad/s and the phase angle δ at an angular

frequency of 100 rad/s, as measured by dynamic mechanical

spectroscopy, at a temperature of 125°C.

12. (New) The process of claim 11, wherein said polymer has a $\Delta\delta > 35 - 15*[VNB]$.

13. (New) The process of claim 11, wherein said polymer has a vinyl norbornene content of between 0.1 and 4 weight %.

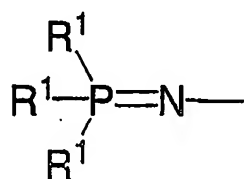
14. (New) The process of claim 11, wherein said polymer comprises at least 0.01 weight % 5-ethylene-2-norbornene.

15. (New) The process of claim 11, wherein said polymer has a $\Delta\delta > 25 - 12.5 * (Q-2)$,

wherein $Q = M_w/M_n$, M_w is the weight average molecular weight and M_n is the number average molecular weight.

16. (New) The process of claim 11 wherein the catalyst system further comprises 0.20 mol or less, per mol of the catalyst of a further activating compound.

17. (New) Process according to ~~of~~ claim 11, wherein the catalyst used contains a phosphinimine ligand which is covalently bonded to the metal, defined by the formula:



Form. VII

wherein each R¹ is independently selected from the group consisting of
a hydrogen atom,

a halogen atom,

C₁₋₂₀ hydrocarbyl radicals which are unsubstituted by a halogen atom,

C₁₋₂₀ hydrocarbyl radicals which are further substituted by a halogen atom,

a C₁₋₈ alkoxy radical,

a C₆₋₁₀ aryl radical,

a C₆₋₁₀ aryloxy radical,

an amido radical,

a silyl radical of the formula III and

a germanyl radical of the formula IV.

18. (New) Process according to claim 17, wherein the catalyst comprises as phosphinimine ligand tri-(tertiary butyl) phosphinimine.

19. (New) Process according to claim 11, wherein the alumoxane used is of the formula: (R⁴)₂AlO(R⁴AlO)_mAl(R⁴)₂ wherein each R⁴ is independently selected from the group consisting of C₁₋₂₀ hydrocarbyl radicals and m is from 0 to 50.